

# Operation Manual

Medical

## AlterG Anti-Gravity Treadmill®



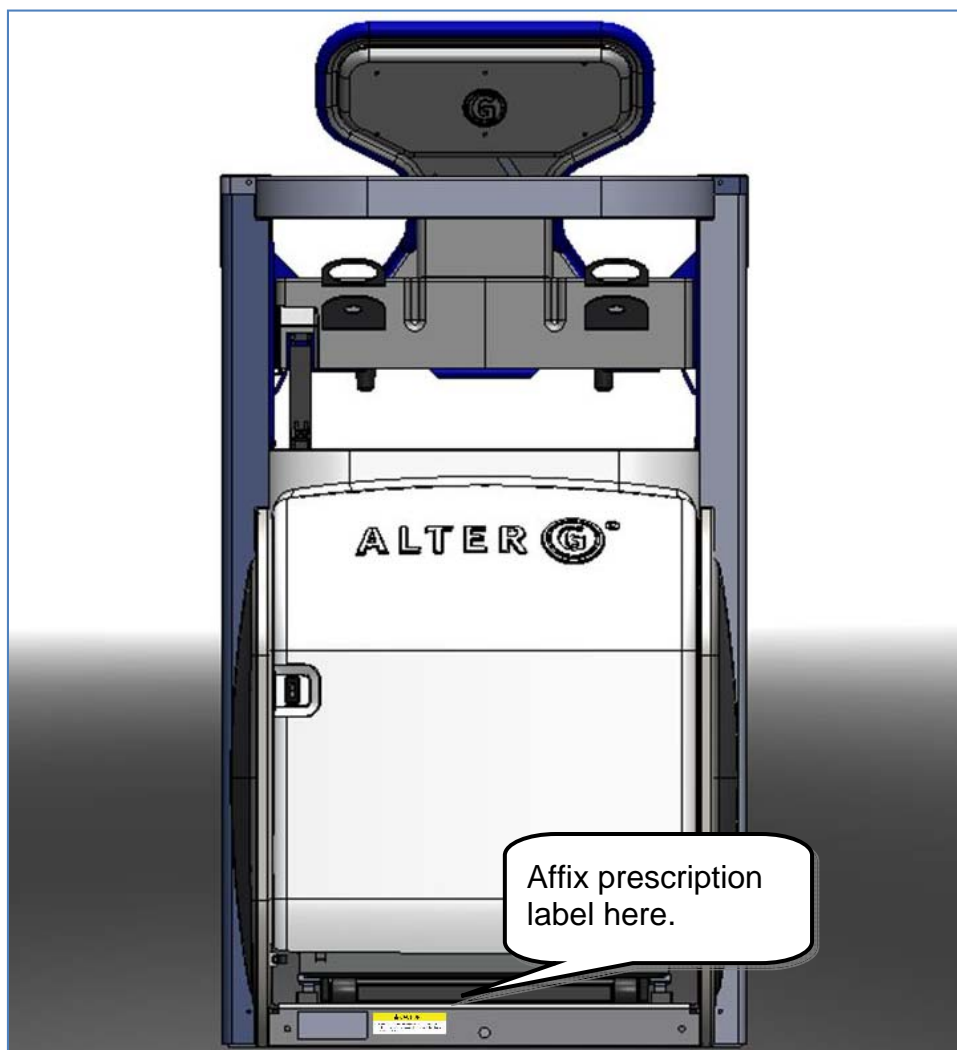
**ALTER** ®  
Defy Gravity



Remove AlterG prescription label (part number 102595) below and apply to M320 as shown.

Affix prescription label p/n 102595 using double sided tape, 3M Scotch Permanent Glue Stick or equivalent

Affix label to front of M320 base frame as shown:





This manual covers operation procedures for the following AlterG products:

AlterG Anti-Gravity Treadmill® M310

AlterG Anti-Gravity Treadmill® M320

**NOTE:** The following symbol is used throughout this manual to call attention to Warnings, Cautions or operational procedures that may directly affect the safe operation of the AlterG Anti-Gravity Treadmill. Read and understand these instructions and statements before operating the AlterG Anti-Gravity Treadmill.



Warning, Cautionary statement or operational procedure that may directly affect the safe operation of the treadmill.

Note: The AlterG Anti-Gravity Treadmill has been tested to IEC medical standards for electrical safety. It is a Class I, Type B device.

Type B Medical Equipment



RoHS compliant product



IEC 60601-1-1 compliant

IEC 60601-1-2 compliant

## IP20

AlterG and Anti-Gravity Treadmill are registered trademarks in the US by AlterG, Inc.

**CAUTION:** Federal law restricts this device for sale by or on the order of a practitioner licensed by the State in which he/she practices.

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## USER RESPONSIBILITY

This Product will perform as described in this Operator's Manual and by accompanying labels and/or inserts, when it is assembled, operated, maintained and repaired in accordance with the instructions provided. This Product must be checked periodically as described in this manual. A defective Product should not be used. Parts that are broken, missing, plainly worn, distorted or contaminated should be replaced immediately. Should such repair or replacement become necessary, it is recommended that a telephone or written request for service advice be made to AlterG Inc. (contact information is available on page 7 of this manual). This Product or any of its parts should not be repaired other than in accordance with instructions provided by AlterG Inc. authorized representatives or by AlterG Inc. trained personnel. The Product must not be altered without the prior written approval of the AlterG Inc. Quality Assurance Department.

The user of this Product shall bear the sole responsibility for any malfunction which results from improper use, faulty maintenance, improper repair, damage, or alteration by anyone other than an AlterG Inc. authorized representatives.

Any unauthorized maintenance, repairs or equipment modification activities may void the AlterG Product Warranty



## AlterG CONTACT INFORMATION

AlterG Inc. welcomes your inquiries and comments. Professional staff, including physiologists, applications engineers, and customer support specialists are available to assist you with any questions you may have regarding your AlterG Anti-Gravity Treadmill system.

### **AlterG Headquarters:**

|                 |  |
|-----------------|--|
| AlterG Address: | 48438 Milmont Drive<br>Fremont, CA 94538             |
| Telephone:      | 510-270-5900   |
| AlterG URL      | <a href="http://www.alter-g.com">www.alter-g.com</a> |

### **Service and Support:**

|                 |  |
|-----------------|--|
| AlterG Address: | 48438 Milmont Drive<br>Fremont, CA 94538                     |
| Telephone:      | 510-270-5369   |
| Email address:  | <a href="mailto:support@alter-g.com">support@alter-g.com</a> |



## INDICATIONS AND CONTRAINDICATIONS FOR USE

### Indications for Use

- Aerobic conditioning
- Weight control and reduction
- Sport specific conditioning programs
- Gait training in neurologic patients
- Strengthening and conditioning in older patients
- Rehabilitation following injury or surgery of the lower extremity
- Rehabilitation following injury or surgery of the hip, knee, ankle or foot.
- Rehabilitation after total joint replacement

### Precautions for Use

- Cardiovascular disease or respiratory compromise resulting in limited exercise tolerance

### Contraindications for Use

- Unstable fracture
- Cardiovascular hypotension



## SAFETY INFORMATION, WARNINGS AND CAUTIONS

Before using the AlterG please familiarize yourself with this manual so that you may operate the AlterG in a safe and effective manner. Instructions may be found throughout this manual, on the control console and on labels applied to the machine. We want your experience with the AlterG to be safe and enjoyable, so please make sure you read and understand this entire manual before operating your system.



**DANGER: Imminently hazardous situation to be avoided that will result in serious injury or death.**

- DO NOT modify the plug provided with the treadmill. The AlterG requires a 20A 220 VAC outlet protected by a 20 amp circuit breaker. The AlterG comes equipped with a 6-20P NEMA plug. If the provided plug will not fit in the outlet, have a proper outlet installed by a qualified electrician.
- Do not use any electrical adapters. To do so could result in an electrical shock hazard.
- Do not operate the AlterG in wet or damp environments.
- Do not operate the heart rate monitor transmitter in conjunction with an electrical heart Pacemaker or similar device. The transmitter may cause electrical disturbances, which can interfere with pacemaker function.
- Always unplug the AlterG before cleaning or servicing.
- Do not soak any part of the AlterG with liquid during cleaning; use a sprayer or damp cloth. Keep all liquids away from electric components. Always unplug the machine before cleaning and maintenance.
- Only an authorized technician should service the system.
- Do not place any liquids on any part of the AlterG.
- Do not unplug or alter any of the internal wiring on the machine after installation.
- Do not operate where aerosol (spray) products are being used.



**WARNING: Potentially hazardous situation to be avoided that could result in serious injury or death.**

- Consult with your physician before beginning any exercise program. This is particularly true if you have any of the following: history of heart disease, high blood pressure, diabetes, chronic respiratory disease, elevated cholesterol, if you smoke cigarettes, or have any other chronic disease or physical impairment.
- If you experience dizziness, chest pains, nausea or any other abnormal symptoms while using the treadmill stop immediately. Consult a physician before continuing.



**CAUTION: Potentially hazardous situation to be avoided that may result in minor or moderate injury.**

- Consult a qualified electrician before using any extension cords. Long extension cords cause a voltage drop to the machine, which may cause it to operate improperly
- ALWAYS USE THE EMERGENCY SAFETY LANYARD SUPPLIED WITH THE ALTERG! It should be fully attached to the user's clothing. This is very important for your safety in case you fall during your workout.
- The AlterG treadmill belt operates like any other conventional treadmill belt. If the patient's Base of Support (BOS) is outside of their Center of Gravity (COG), the belt can slide slowly forward or backward. This can be alleviated easily by instructing the user to properly position their BOS. Care should be taken when entering, exiting, and standing in the cockpit.
- Read and understand all instructions before using the AlterG.
- Read about, understand and test the emergency stop feature.
- Never leave children unsupervised around the AlterG.
- Inspect the AlterG for worn or loose components prior to use. Tighten/replace any worn or loose components or bolts prior to use.
- Pregnant women or women who may be pregnant should consult their physician before using the AlterG.
- The AlterG must be used under the supervision of a properly trained operator. At no time should a user of the machine exercise without appropriate supervision; even if having been previously trained in the proper operation of the device.
- Set up and operate the AlterG on a solid, level surface.
- Keep all loose clothing and towels away from the treadmill running surface. DO NOT store anything (like shorts) inside the bag.
- Prior to beginning a workout, check to make sure there is no debris inside the AlterG.
- Always keep the running surface clean.



- Keep the area around the treadmill clear. Make sure you leave at least 2 feet on either side of the AlterG to accommodate bag expansion during inflation.
- Keep hands away from the bag and frame structure during inflation to avoid pinching.
- Keep hands away from all moving parts.
- Wear proper athletic shoes, such as those with rubber or high-traction soles. Do not use shoes with heels or leather soles. Make sure no stones or sharp objects are embedded in the soles.
- As with any treadmill workout, include a cool-down phase at the end of your exercise session. Return to full body weight and exercise moderately before stopping. Avoid abruptly ending or pausing your workout while at reduced body weight or high speed.
- The safety and integrity of the machine can only be maintained when the AlterG is regularly examined for damage and wear and is properly repaired. It is the sole responsibility of the user/owner or facility operator to ensure that regular maintenance is performed. Worn or damaged components must be replaced immediately and the AlterG removed from service until the repair is made. Only manufacturer supplied or approved parts should be used to maintain and repair the AlterG.
- The Strataglass windows on your AlterG unit require conditioning to prevent premature cracking. After each workout, please lock the cockpit at position 15 (highest setting).



## **SECTION 1: INTRODUCTION**

### **THINGS TO CONSIDER BEFORE BEGINNING AN EXERCISE PROGRAM**

#### **CONSULT A PHYSICIAN**

Anyone considering an exercise program or an increase in activity should consult a physician. If you have cardiovascular disease or there is a history of such disease in your family, are overweight or are not currently involved in an exercise program, it is highly recommended that you follow the guidance of your physician before and during an exercise program or any other increase in physical activity.

#### **CONSULT A PROFESSIONAL FITNESS TRAINER**

In addition to following the recommendations of a physician it is advisable to consult a professional fitness instructor or personal trainer to develop an overall fitness evaluation/wellness program that is tailored to your particular needs.

#### **UNDERSTAND THE IMPORTANCE OF WARMING UP AND COOLING DOWN**

It is important to gradually “warm up” and “cool down” prior to and at the end of each work out, respectively. Always try to incorporate a series of basic stretches before and after each workout. Stretching encourages the necessary flexibility to help prevent sore muscles and injury during daily activities. Do not abruptly end your exercise session on the AlterG. Always restore your full body weight slowly and include a few minutes of walking at full body weight and low intensity before stopping your exercise session.

#### **HOW OFTEN AND FOR HOW LONG SHOULD YOU EXERCISE?**

The American College of Sports Medicine recommends a frequency of 3 to 5 days per week for a duration of 20 to 60 minutes, dependent on the intensity of the exercise session.<sup>1</sup> The United States Department of Agriculture suggests that physical activity should be moderate or vigorous and add up to at least 30 minutes a day. The USDA defines moderate as walking briskly at about 3.5 miles per hour while vigorous activity is running or jogging at 5 miles per hour.<sup>2</sup> These are general guidelines; you should determine what is appropriate for you with the help of your physician.

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<sup>1</sup> Medicine & Science in Sports & Exercise. Volume 30 (6) pages 975-991, 1998

<sup>2</sup> [http://www.mypyramid.gov/pyramid/physical\\_activity.html](http://www.mypyramid.gov/pyramid/physical_activity.html)



## SECTION 2: SETUP AND INSTALLATION

An AlterG qualified technician will install the AlterG Anti-Gravity Treadmill after delivery. Please make sure that you inspect the AlterG upon delivery for any damage that may have occurred during transportation. Take pictures and immediately report any damage to the shipping company and AlterG. When you sign for the shipment of your AlterG, you are taking responsibility for any damage that may occur before installation.

### ELECTRICAL REQUIREMENT

The recommended electrical outlet/power source for the AlterG Anti-Gravity Treadmill is a 20 ampere, 220VAC @ 60 Hz dedicated circuit with ground. The plug supplied with the AlterG Anti-Gravity Treadmill is designated by the NEMA configuration system as 6-20P. The corresponding receptacle for the plug is a NEMA 6-20R.

International systems are shipped without a plug on the power cord. An appropriate plug for the country and facility in question should be wired as follows:

Black Conductor: Line  
Black Conductor: Line  
Green/Yellow Conductor: Ground

### GROUNDING REQUIREMENTS

The AlterG must be grounded electrically. If there is an electrical malfunction, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. The AlterG is equipped with a power cord with a grounded plug (domestic systems). This plug must be plugged into an appropriate receptacle (NEMA 6-20R) that is properly installed and grounded in accordance with the current National Electrical Code as well as all local codes and ordinances. If you are at all unsure of these requirements, contact AlterG for clarification.

### LOCATION REQUIREMENTS

The AlterG is 38 inches wide and 84 inches long. It weighs approximately 750 pounds. It needs to be placed on a structurally sound surface. If it is used above ground level it is advisable to place it near the corner of the room or where the floor will be strongest to ensure maximum support during high-speed, high-impact use. The surface should be level to ensure minimal flexing of the AlterG frame. It is recommended that the AlterG be placed on a rubber mat or padded indoor/outdoor style carpet. The front of the AlterG needs to be within 10 ft (3.05 meters) of the proper electrical outlet. Check with a

qualified electrician or AlterG if you plan on extending the cord in any way. Make sure you leave at least 24 inches on either side of the AlterG to allow the bag to expand during inflation. Allow 40 inches behind the AlterG to accommodate a user getting in and out of the AlterG system safely.

We recommend an area at least 12 feet (3.66 meters) long by 8 feet (2.44 meters) wide to provide adequate space for operation and user access. Also check ceiling height to ensure users won't hit their heads. The treadmill surface is approximately 8" (20 cm) off the floor when level and can be higher when the subject is running on a grade. An 8 foot (2.44 meter) ceiling may be too low for taller users.

### **TRANSPORTING YOUR TREADMILL**

Contact AlterG if you plan on moving your treadmill. Damage sustained by improperly moving the AlterG will not be covered by your warranty.

## SECTION 3: PRINCIPLES OF OPERATION

AlterG's technology was originally conceived as part of an effort to help NASA's astronauts maintain fitness during prolonged space flight. AlterG pioneered the concept of combining this technology with an advanced pressure regulation system and treadmill into a machine that provides the most effective and comfortable body weight support system available today.

### PHYSICS & TECHNOLOGY BEHIND THE ALTERG

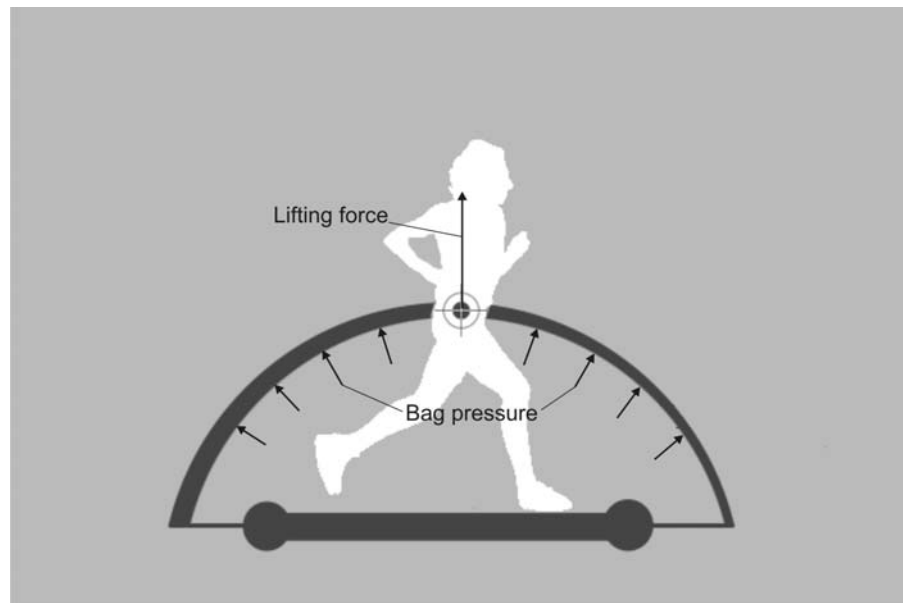


Figure 1. Diagrammatic Representation of Lifting Force

### DIFFERENTIAL AIR-PRESSURE (DAP) TECHNOLOGY

The physical lifting force generated by the AlterG comes from a difference in air pressure around the user's upper and lower body. AlterG uses this methodology, known as Differential Air Pressure (DAP) technology to unweight the user.

An inflatable fabric enclosure covers the treadmill. In the middle of the enclosure is a hole through which the user steps onto the surface of the treadmill. The user wears a special pair of shorts, and these shorts are zipped into the hole in the enclosure. A blower is used to inflate the enclosure. The pressure generated in the inflated enclosure provides a lifting force against the body. Because the pressure is only slightly above atmospheric and evenly distributed, the force on the lower body is almost imperceptible. The AlterG provides a level of comfort while exercising unmatched by other unweighting systems.

## **PRESSURE REGULATION SYSTEM**

AlterG has developed an advanced and very sophisticated pressure regulation system that ensures the AlterG has extremely accurate weight control with good reproducibility between sessions. When you run in the AlterG, the natural bouncing motion of your body changes the shape and volume of the bag. This effect would change the interior pressure of the bag and your effective exercise weight if it were not for the pressure regulation system in the AlterG that monitors and reacts to these changes. This technology makes rapid adjustments to the bag pressure, maintaining the pressure in the bag and your exercise body weight at near constant levels.

## **AIR SEAL SHORTS**

In order to seal users into the AlterG in a comfortable and convenient manner, AlterG has designed a special pair of shorts. These create an airtight environment around the lower body, and the zipper provides a mechanism to quickly attach and detach from the enclosure. The shorts are easy to take on and off and sealing with the machine is as simple as zipping up a jacket. The shorts are similar to those worn by many professional athletes for compression and support during training activities.

Figure 2. AlterG Compression Shorts





## SECTION 4: OPERATING THE ALTERG

### POWERING UP

The AlterG is turned on by operating the switch located on the front cover of the system.

**Note:** Once the power switch is turned on, wait 30 seconds before the subject attempts to use the AlterG. The system requires 30 seconds to run a series of diagnostic tests. The weight control display will show 0 or L and the treadmill display will be blank when the system is ready to be used.



Figure 3. Front power switch

### PUTTING ON THE SHORTS

Your AlterG comes with dedicated shorts that ensure an airtight seal in the fabric enclosure. Slip the shorts on in the same manner as a conventional pair. The life of the shorts will be extended and they will be easier to put on if you first remove your shoes.

Select a short size that is snug but not uncomfortable, and make certain the tag is at your back and on the inside of the shorts. The long tail of the zipper should be in front. It is advisable that you wear a pair of running shorts or tights under the AlterG shorts.

## STEPPING INTO THE ALTERG

Lower the cockpit so it compresses the bag against the treadmill surface (Figure 5). Push it all the way down for ease of entry. Enter from the back and step into the opening in the fabric enclosure. It is fine to step on the fabric as you enter, but make sure that you have no rocks or sharp objects embedded in the soles of your shoes that could mar or damage the bag.



**CAUTION:** The AlterG Anti-Gravity Treadmill belt operates like any other conventional treadmill belt. If the patient's Base of Support (BOS) is outside of their Center of Gravity (COG), the belt can slide slowly forward or backward. This can be alleviated easily by instructing the user to properly position their BOS.



Figure 4. Cockpit in the Lowered Position

## ADJUSTING THE HEIGHT OF THE COCKPIT

The cockpit slides up and down on a bearing system and is counter-weighted to make it easy to lift.



**CAUTION:** Before lifting the cockpit, ensure that the cockpit lock is in the open position, all the way to the left side of its travel. If it is not fully unlocked, it may engage in the lowest position as you lift. See Figure 6.



Figure 5. Cockpit Lock in Open Position

Stand centered in the hole in the fabric enclosure facing forward with both feet on the treadmill belt. Lower yourself by bending at the knees and grasp the cockpit on either side. With a straight back and good lifting technique, lift the cockpit to the appropriate height and engage the lock by pulling the lock lever to the right. Do not force the lever. You may have to “jiggle” the cockpit up and down slightly to get the lock pins to engage. When fully engaged, the lock lever will be positioned all the way to the right in the slot. See Figure 7.



Figure 6. Cockpit Lock Fully Engaged

There is a range of heights at which the cockpit can be placed. For greatest freedom of movement, place the tubing that comprises the cockpit slightly below the greater trochanter of the femur. Figure 8 demonstrates this position.



Figure 7. Cockpit Location Relative to Trochanter



For more support and stability place the cockpit in a higher position. Some users use the iliac crest as a reference point. Pull up on the zipper sewn to the enclosure and align the zipper with the iliac crest as shown in Figure 9.



Figure 8. Adjustment of the Cockpit to Align the Zipper with the Iliac Crest

You should never attempt to move the cockpit while the fabric enclosure is inflating or when fully inflated. If you discover while you are exercising that you need to reposition the cockpit, you will have to stop the workout, re-adjust the height of the cockpit and start again.

## **ZIPPING INTO THE FABRIC ENCLOSURE**

Once the cockpit is in place, zip yourself into the AlterG. The zipper should be started at the front and center of your body and zipped counter-clockwise all the way around until it returns to overlap in the front. Make sure that the zipper is completely closed.

## USE OF THE SAFETY LANYARD

It is essential that you ALWAYS use the magnetic safety lanyard supplied with the machine. Secure the clip all the way onto your clothing and place the red magnet on the circular locator labeled “Emergency Stop”.

The lanyard and magnet serve as a safety switch mechanism. If you become uncomfortable during exercise you can pull or swipe the lanyard to displace the magnet and stop the system. Should you fall while exercising, the magnet will be pulled from the console and the system will stop.



Figure 9. Safety Lanyard and Magnet Location



**WARNING: NEVER attempt to defeat this critical safety feature by attaching the lanyard to the structure of the machine or anywhere else besides your clothing.**

## OPERATING THE TREADMILL AND UNWEIGHTING SYSTEM



Figure 11. Operating Console

All treadmill and pressure functions are controlled from the console. Graphic icons and labels identify button locations and functions. Buttons are touch sensitive and require light pressure to operate.



Figure 12. Left Side Console Controls

#### STEP 1: PREPARATION FOR EXERCISE.

Before pressing START, stand still on the surface of the treadmill belt. Do not hold onto or support yourself on any part of the system structure. The system weighs you prior to exercise and the treadmill must support your full body weight.

#### STEP 2: BEGINNING THE EXERCISE SESSION.

Press START to begin the exercise session. The AlterG will proceed with a calibration routine that allows the system to determine the relationship between enclosure pressure and your body weight. During this routine the display will say CAL and the single green LED next to the word Calibrating will light. You will feel the pressure in the bag change as the system calibrates. It is best to cross your arms while the routine runs to avoid touching any part of the structure and ruining the calibration.

The READY LED will light at the end of the calibration routine. The Weight Control display will now read 100%, indicating you are at full body weight on the surface of the treadmill. Power will be applied to the treadmill and its' displays will light and the buttons will become functional.

#### STEP 3: ADJUST YOUR BODY WEIGHT.

Adjust your body weight with the + and – button controls. Pressing – decreases your body weight, pressing + increases your body weight. Your body weight is displayed as a percentage of your full body weight. You can adjust your body weight at anytime during your exercise session.





**CAUTION:** At 40% body weight and lower, you can become unstable if you jump or perform any other activity besides walking or running. Reduce your body weight percentage slowly so you can become accustomed to the new sensation and adjust your gait mechanics accordingly.

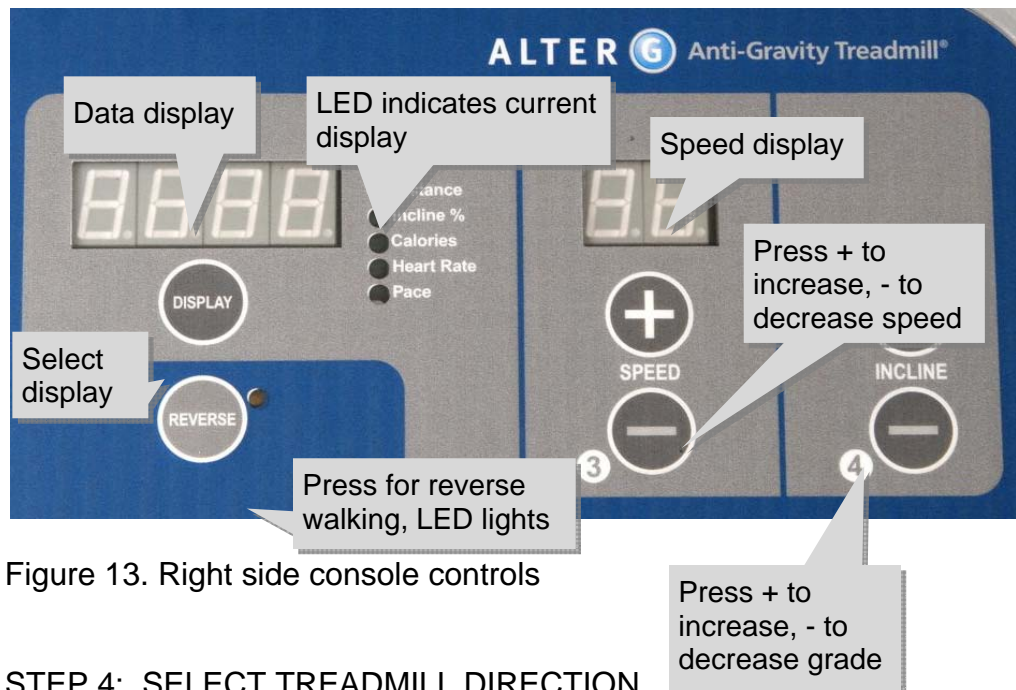


Figure 13. Right side console controls

#### STEP 4: SELECT TREADMILL DIRECTION

When the treadmill turns on, it is programmed for forward ambulation. Press the REVERSE button to walk backwards. The green LED next to the button will light when the treadmill is programmed for reverse.

#### STEP 5. ADJUST TREADMILL SPEED.

Speed is incremented and decremented by pressing the + or – button respectively. In the forward direction, speed will increase in .1mph (.16 km/hr) increments for each button push. When the treadmill is programmed in reverse, speed will increase in .1 mph (.16 km/hr) increments up to a maximum of 3 mph (4.8 km/hr). Holding either button down for more than 2 seconds causes the speed to increment or decrement at a faster rate.

**Note:** For speeds above a value of 10 (for both mph and kph) the speed display alternates between the integer and fractional speed setting.

#### STEP 6: ADJUST TREADMILL GRADE

Press the + button to increase grade, press the – button to decrease grade. Holding the button down for more than 2 seconds will cause grade to change at a more rapid rate.

**Note: Treadmill grade cannot be adjusted greater than 5% if speed is set for less than .5 mph (.8 km/hr).**

#### STEP 7: ENDING THE EXERCISE SESSION

Return the treadmill to 0% incline before stopping your session.

Press the STOP button to end exercise. The treadmill will run through a shutdown routine and the pressure will be released from the inflated enclosure. All exercise information will be cleared from the display.

#### FUNCTION OF THE PAUSE BUTTON

Press the PAUSE button to place the treadmill in the pause mode. The treadbelt will stop but all statistical information will be preserved. Body weight support is maintained while in the pause mode. Press the PAUSE button again to resume exercise.

#### FUNCTION OF THE DISPLAY BUTTON

Press DISPLAY to choose a different statistic to be displayed. Each button push causes the display to proceed to the next exercise variable. The green LED will light next to the variable being displayed. The following statistics are available for display:

- Time
- Distance
- Incline %
- Calories burned (an estimate at 100% BW and 0% grade)
- Heart Rate
- Pace (minutes/mile)

If the DISPLAY button is held down for more than 2 seconds, the display will cycle through the data continuously. A second press will stop the cycling.

#### STEPPING OUT OF THE TREADMILL

Wait for the treadbelt to stop and the enclosure to fully deflate before exiting the system. Unzip your shorts and pull the top “skirt” of the shorts from under the enclosure lip. Open the cockpit lock to disengage it from its locked position. Lower the cockpit onto the surface of the treadbelt and exit to the rear of the system.

## **HEART RATE MONITORING**

### **HEART RATE MONITOR**

The AlterG display is designed to receive a user's heart rate in conjunction with the use of a Polar® (Chest Strap) Heart Rate Monitor.<sup>3</sup> Polar chest straps can be purchased at most popular sporting goods stores or online. In order for the screen to correctly display a user's heart rate, the receiver within the display must obtain a stable heart rate signal from the Polar transmitter. The Polar Heart Rate System consists of two main elements: 1) the sensor/transmitter and the receiver within the AlterG display.

### **HOW TO WEAR THE CHEST STRAP TRANSMITTER**

The Sensor/Transmitter is worn just below the chest and at the top of the abdomen, directly on bare skin (not over clothing). The transmitter should be centered below the pectoral muscles. Once the strap is secured, pull it away from the chest by stretching the band, and moisten the conductive electrode strips with plain water. The transmitter operates automatically while you are wearing it; it does not operate while it is disconnected from your body. However, as moisture may activate the transmitter and salt buildup from sweat can be a problem, rinse the transmitter with water and wipe it dry after use. The chest band is washable. After you have detached the transmitter, wash the band in warm water using mild soap and rinse thoroughly in clean water.

### **THE RECEIVER**

You must be within two and a half feet of the receiver in order for the signal to be received. Please take note that your transmitter may fluctuate erratically if you are too close to other Polar equipment. Maintain at least a three-foot distance between other Polar units.

**NOTE:** Erratic heart rate reception may occur if the Polar Monitor is too close in proximity to strong sources of electromagnetic radiation, such as television sets, Personal Computers, electric motors and some other types of fitness equipment. Only one transmitter should be used inside the range of any one receiver as the receiver may pick up several signals simultaneously, causing an inaccurate readout.

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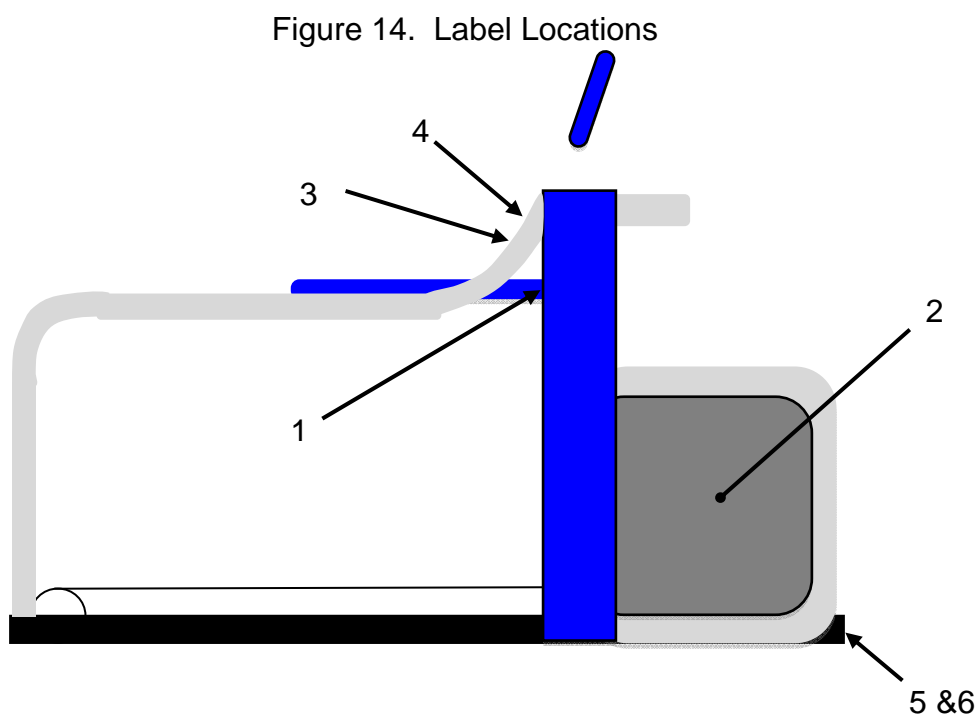
<sup>3</sup> Polar® is a registered trademark of Polar Electro, Inc. Lake Success, NY



## SECTION 5: LABELS, LOCATIONS, INTERPRETATION

Read and understand the labels on the AlterG Anti-Gravity Treadmill. The labels provide information on the operation of the system and should be followed for a safe and enjoyable exercise experience. Should any of the labels become damaged and unreadable, immediately contact AlterG for replacements.

The location of the labels is indicated in Figure 14. Refer to the diagram to locate the label being described.



**Label #1.** This label is located on areas of the Anti-Gravity Treadmill frame that present a pinch hazard. Hands or any other part of the body should not be placed in these areas during operation of the system.



**Label #2.** This label is located within the structure of the Anti-Gravity Treadmill and indicates a high voltage is present in that location. If you see this label, do not get close to or disassemble any of the components to which it is attached. The high voltage can cause serious injury or death. Only a qualified AlterG Service Technician should attempt any repairs in these areas.



**Label #3.** This label is located on the front of the cockpit structure.

You must be in good health to exercise on the AlterG. Consult with your physician before beginning an exercise program. If you experience discomfort or unusual symptoms while exercising on the system, stop immediately and consult your physician before resuming your exercise program. You must be trained in the proper use of the machine and its safety features prior to exercising. Always use the safety lanyard.



Read and understand the Operator's Manual before using the AlterG Anti-Gravity Treadmill.

Lock the cockpit in place by moving the locking lever from left to right. Make sure the lever is all the way to the right prior to operating the system.

**Label #4:** The emergency stop label indicates where you should place the emergency stop magnet prior to exercising. In use, if any sort of emergency should arise, a tug on the attached lanyard will displace the magnet and stop the treadmill. The label is located on the front of the cockpit structure.



**Label #5:** This label is located at the front of the treadmill on the base frame. AlterG manufactures the AlterG Anti-Gravity Treadmill in its facilities in Fremont, California, USA.



**Label #6.** Located at the front of the treadmill on the base frame, AlterG's representative in Europe is Obelis s.a.

European Authorized Representative:  
 Obelis s.a. Tel: +(32) 2.732.59.54  
 Bd. Général Wahis 53 Fax: +(32) 2.732.60.03  
 1030 Brussels, Belgium Email: mail@obelis.net

**Label #6:**

This label is located on the back of the cockpit carriage between the stanchions. The AlterG Anti-Gravity Treadmill is a prescription device in the United States.







## SECTION 6: ALTERG MAINTENANCE

In order to ensure the safe operation and longevity of your AlterG Anti-Gravity Treadmill periodic maintenance should be performed. For the more complex tasks ***AlterG recommends that you employ the services of a qualified technician.***



**WARNING: Make sure the AlterG Anti-Gravity Treadmill is turned off and unplugged before performing any of the maintenance detailed below.**

### GENERAL CLEANING AND INSPECTION

Periodic cleaning and inspection will help lengthen the life of your treadmill and keep it looking good. The biggest contributor to the failure of the machine will be dirt and debris accumulation inside the treadmill. To prevent this, ensure users always wear clean shoes while they exercise. Since it is a sealed system, the presence of dirt and debris greatly reduces the longevity of the product.

Keeping the system clean will also make it easier to spot any problems that might not otherwise be found until it is too late. Below is a general guideline on cleaning and maintenance intervals. If the treadmill is in a dirty environment or under heavy use, cleaning and inspection intervals should occur more frequently. Do not use abrasive brushes or cleaners, as they will mar and scratch the paint and plastic surfaces. Also, do not soak any surface with a liquid, as the electronics can be damaged or when wet may, pose an electrical hazard.

#### DAILY:

1. Inspect the interior of the fabric enclosure for any loose debris and remove.
2. Check for abnormal operation.  
Ensure that there are no unusual performance characteristics such as:
  - Unusual sounds (from the treadmill, air blower, or fabric enclosure such as hissing or air leaks).
  - Unusual sights, or smells that appear out of the ordinary.
  - Any operational characteristics that have changed such as reduced speed of treadmill or erratic or low fabric enclosure pressure (Note that low fabric enclosure pressure can be a cause of a mis-calibration so ensure that you have properly followed the calibration steps before you determine there is a pressurization problem).

**WEEKLY:**

1. Check overall condition of the treadmill.
2. Inspect the fabric enclosure for tears or leaks.
3. Wipe down exterior surfaces with a damp cloth. A mild soap solution can be used. IMAR™<sup>4</sup> Strataglass Cleaner is recommended for cleaning the clear windows.
4. Clean the control console with a mild soap solution to remove grime.
5. Vacuum the interior of the fabric enclosure through the access hole in the top. You can position the cockpit in the highest position and crawl inside for better access. Vacuum or wipe down the deck area between treadbelt and frame.
6. Check shorts for rips or holes.

**MONTHLY:**

Perform weekly maintenance items and in addition do the following:

1. Unplug the M300. Let sit for 10 minutes.
2. Remove the front third of the base of the bag. Take off the motor cover and vacuum the inside of the motor area being very careful to avoid touching sensitive electronics.
3. Clean the rear treadmill mounts
  - Remove bag from rear third of treadmill
  - Lift rear of treadmill a few inches so the treadmill rear feet clear the retaining cups
  - Reposition treadmill left to expose right load-cell cup
  - Vacuum debris from inside of cup and the base board
  - Repeat process moving treadmill to right side exposing the left cup
  - Vacuum debris from left cup and base board
4. Feel the surface of the deck under the treadbelt. It should feel slick and slightly moist with lubricant. If there is debris accumulation or if it is dry or tacky perform the following:
  - Wipe the deck and underside of the treadbelt with a clean towel. Rotate the belt to expose the remaining section and wipe again.
  - Apply one 1 ounce packet of SlipCoat<sup>5</sup> under the treadbelt. Walk for one minute on the treadmill at a low speed to disperse the lubricant. SlipCoat is very slippery. If you get it on the top surface of the belt or railings, clean with rubbing alcohol and a sponge.

SlipCoat may be found online or you can order directly from AlterG.
5. Check drive belt tension.
6. Check tread belt tension.

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<sup>4</sup> IMAR is a trademark of IMAR Products, LLC. Manassas, VA.

<sup>5</sup> SlipCoat is a product of Landice Inc., Randolph, New Jersey.

**SEMI-ANNUALLY:**

- Check motor brushes for wear. Dress commutator with stone if needed.

**ANNUALLY:**

***Note: AlterG recommends that you have a qualified technician perform the annual maintenance.***

1. Perform the following procedures annually:
  - Inspect all nuts and bolts. Tighten any that are loose.
  - Remove the bag and thoroughly vacuum under and around the treadmill.
  - Clean the running surface, if necessary use a bristle brush to remove heavy grime.
  - Check and adjust treadbelt alignment if needed.
  - Wipe down the treadmill deck under the treadbelt.
  - Lubricate the treadmill deck with SlipCoat.
  - Vacuum under the treadmill motor cover.
  - Adjust the drive belt tension. Replace the belt if worn or damaged.
  - Inspect the treadmill motor brushes and replace if worn below 3/8 inch. Dress the commutator if needed.

**SEASONALLY:**

1. In autumn & winter the drier climate in many regions of the country may cause a static charge build-up to occur when the treadmill is used. Spray the running surface with a staticide spray to prevent static shock to treadmill users and to prevent interference with the treadmill's electronic systems. A worn out treadbelt can also contribute to a static problem. Examine the belt for excessive wear and replace if necessary.

**CLEANING THE WINDOWS**

The windows on your AlterG are made of Strataglass™<sup>6</sup>. Special care must be taken to ensure they remain clean and clear. Strataglass recommends the use of IMAR Strataglass Protective Cleaner for general cleaning. Other cleaning products may dull the clear finish. You should do this cleaning regularly (about once a week, depending on usage).

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<sup>6</sup> Strataglass is a trademark of Strataglass, Inc., Fort Lauderdale, FL

Once annually, apply IMAR Strataglass Protective Polish. A coat of polish protects against pollutants and will help to keep the Strataglass clear and flexible. Both products are available from AlterG.

## **SHORTS**

Always remove your shoes when getting in and out of the shorts if at all possible. Keeping your shoes on while putting on the shorts creates a great deal of stress on their seams and **WILL SIGNIFICANTLY REDUCE THE LIFE OF YOUR SHORTS.**

Wash the shorts frequently to keep them sanitary. **HAND WASH OR USE A GENTLE WASH CYCLE WITH COLD WATER AND LET AIR DRY. DO NOT PUT SHORTS IN THE DRYER!**

Lubricate the zipper on the shorts as needed. Zip Care<sup>TM7</sup> is a readily available product designed for this application and is available online or from AlterG.

If any part of the shorts wear out (wire, seams, etc.) discontinue use.

## **FABRIC ENCLOSURE MAINTENANCE**

Check the fabric enclosure for any leaks and note any large abnormal hissing sounds. A small leak at the corners of the base or through the shorts and zipper is normal. If these or other leaks start affecting the maximum pressure capabilities of the AlterG system, contact AlterG for troubleshooting and support.

Lubricate the zipper on the fabric enclosure as needed.

The Strataglass windows on your AlterG unit require conditioning to prevent premature cracking. After each workout, please lock the cockpit at position 15 (highest setting).

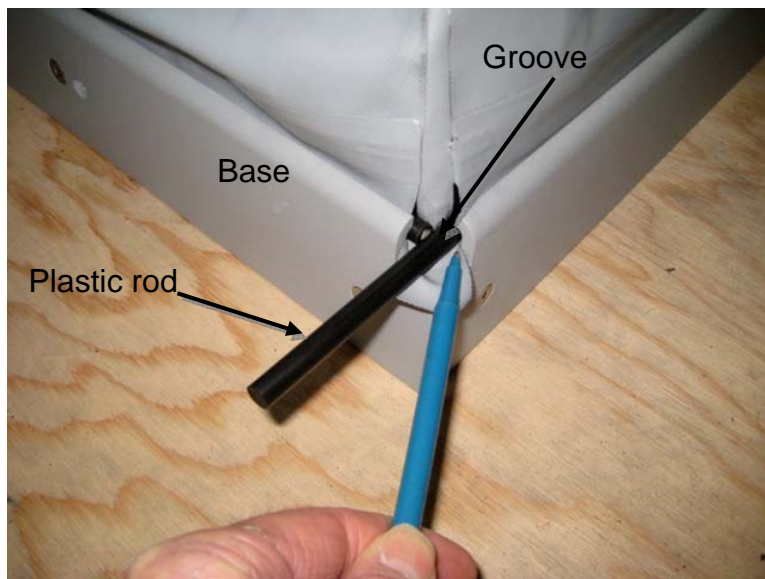
## **REMOVAL OF THE FABRIC ENCLOSURE**

You may find that many of the maintenance tasks are made easier if the fabric enclosure is removed from the base of the system. The enclosure has a hem sewn in the lower edge. The hem fits in a groove in the base. A plastic rod is inserted through the hem and groove, attaching the bag to the base. Use a blunt instrument to push the rod a short distance out of the base. When an adequate length is exposed, grab it and pull to remove completely. The rods in the front and back of the system should be removed first followed by the sides. Installation is the reverse of removal.

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<sup>7</sup> Zip Care is a trademark of McNett Corporation, Inc., Bellingham, WA

Figure 15. Method of Enclosure Attachment to the Base



**NOTE: It is highly recommended that you employ the services of a qualified technician to perform the following maintenance tasks.**

## **ADJUSTING TREADBELT TRACKING**

The treadmill should track in the center of the treadmill deck. If the tracking needs adjustment, proceed in the following manner.

The treadmill is tracked by means of two adjustment bolts (9/16" wrench) located at the rear of treadmill (See Figure 16 on the following page). By tightening the "close" side and loosening the opposite (same amount), you can change position of rear roller without changing overall tension. Adjustments should be made with the treadmill running, and should be made in 1/4-turn increments. Allow at least 30 seconds for the treadmill to stabilize between each adjustment.

Turning the treadmill on:

To operate the treadmill independently of the system, the unit must be in the diagnostic operating mode. To place the system in the diagnostic mode perform the following:

- Turn the system on with the power switch on the front.
- Wait 30 seconds for the system to go through its startup routine.
- Simultaneously press the %Weight + and – keys.
- Press START. The treadmill display will be activated and the treadmill can now be operated.

To return to the operational mode after adjustment perform the following:

- Press STOP. Wait for the treadmill to cycle through its stop routine.
- Simultaneously press the %Weight + and – keys.
- The system is now in operational mode.

For example, if the treadmill is tracking to the right:

- Turn treadmill on, and bring speed up to 6.0 mph.
- Using a 9/16" wrench, tighten the right-hand adjustment bolt 1/4 turn.
- Loosen the left-hand adjustment bolt 1/4" turn.
- Let the treadmill stabilize (rotate for 30 seconds) and readjust if necessary.
- Return the system to the operational mode.

Figure 16. Adjusting the Treadbelt Tracking or Tension



## ADJUSTING TREADBELT TENSION

The need for tensioning is indicated by uneven belt speed and may be sensed by sudden stopping of the treadbelt when walking or running. The same adjustment bolts used for tracking also tension the treadbelt. To tighten the treadbelt, turn both adjustment bolts (clockwise) exactly the same amount. Failure to turn them equally will effect belt tracking.

Before tightening the treadbelt, be certain your drive belt is not loose (see DRIVE BELT TENSION below). **DO NOT OVER TIGHTEN THE TREADBELT.** If you can't reach the palm of your hand under the center of the treadbelt, THE TREADBELT IS TOO TIGHT.

## ADJUSTING DRIVE BELT TENSION

***UNPLUG THE TREADMILL before performing this adjustment.***

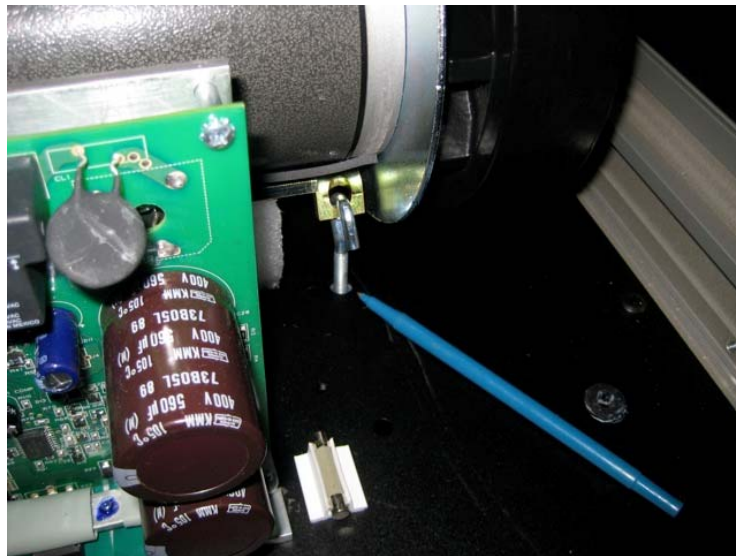
The drive belt is tensioned by a nut (7/16" wrench) located under the motor pan which threads to a tensioning hook attached to the drive motor mounting bracket. By turning the nut clockwise, you will tighten the tensioning hook, pulling down the drive motor mounting bracket and tightening the drive belt. **DO NOT OVER TIGHTEN.** If you over tighten the belt you may snap the motor shaft. To gauge tension, pinch the drive belt midway between the drive motor and the front drive roller using your fore-finger and thumb. Attempt to twist the belt. Ideal tension will allow you to twist the drive belt 45 degrees, if you cannot twist the drive belt at least 45 degrees, THE DRIVE BELT IS TOO TIGHT!

Figure 17. Checking Drive Belt Tension





Figure 18. Tensioning Hook for Adjusting Drive Belt

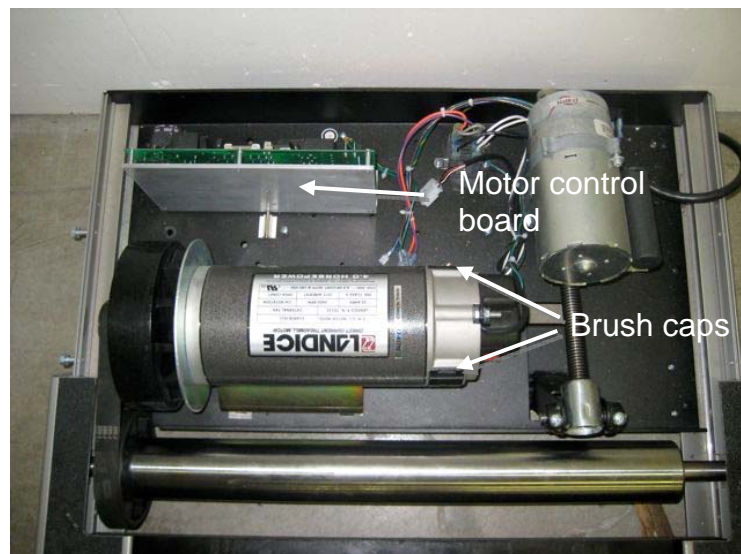


## MOTOR BRUSH INSPECTION/REPLACEMENT

***UNPLUG THE TREADMILL before checking the motor brushes.***

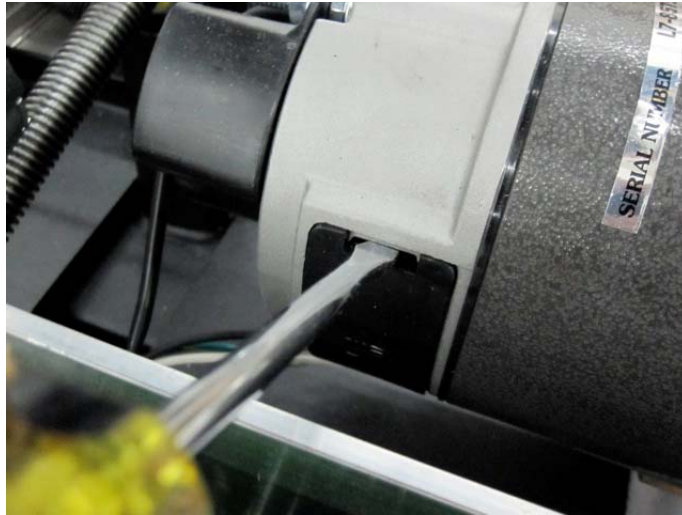
Move the motor control board out of the way. Remove the two screws holding the motor control board to the motor pan and move the board forward to provide better clearance for working. Do not unplug the board from any of the electronic cables.

Figure 19. Detach and Move the Motor Control Board.



Remove the motor brush caps on either side of the motor.

Figure 20. Removing the Motor Brush Cover



Remove the motor brushes and inspect them. Pressing down on the tab above the brush will release it from its holder. They should be replaced if  $\frac{3}{8}$  inch or less in length.

Figure 21. Releasing the Brush from the Holder

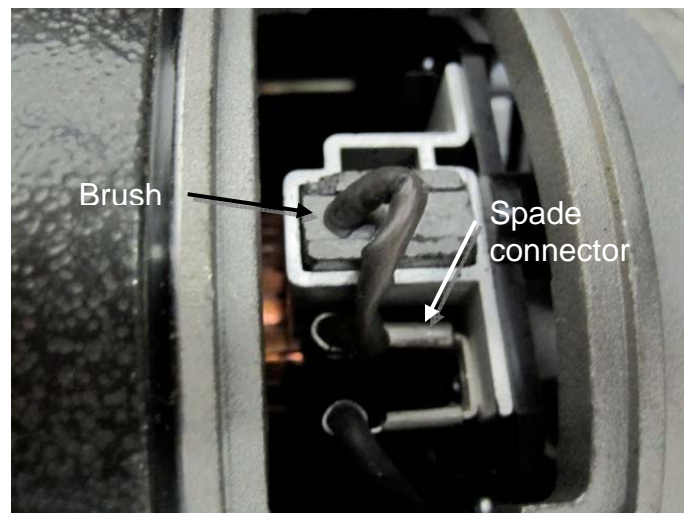


Figure 22. Measuring the Length of the Motor Brush



The brush is connected to the motor with a spade connector. Use a screwdriver blade or small needle nose pliers to slide the connector off of its mating part.

Figure 23. Brush in Holder Showing Location of Spade Connector



When replacing the brush, make sure it slides with no resistance inside the holder. If resistance is felt, dress the sides of the brush with emery cloth or a small file until it slides freely.

Replace the brush holder by pushing it in place until it clicks.

Figure 24. Sliding the Brush Holder in Place



Inspect motor commutator for wear (black scoring present on copper segments). Dress with emery cloth if scored.

## **APPENDICES**

**A: Specifications**

**B: Options and Accessories**

**C: Troubleshooting**

**D: EMC Statement**

**E: User/Reader Comment Form**

**F: Warranty**



## APPENDIX A: ALTERG SPECIFICATIONS

### MODEL M310, M320

- Fits individuals from 4'8" (142 cm) to 6'4" (193 cm); 18.5" (47 cm) hip width, 58" (147 cm) hip circumference.

### PERFORMANCE

- User weight capacity: 400 pounds (181.4 kg)
- Body Weight Range Adjustment:
  - Up to 320 lbs (145.2 kg) 20% – 100% of user's body weight
  - >320 lbs (145.2 kg) 35% - 100% of user's body weight
- Running surface area:
  - 20 inches (51 cm) wide
  - 58 inches (147 cm) long
- Speed range:
  - Forward M310 0 – 8 mph (12.9 km/hr) km, M320 0 – 12 mph (19.3 km/hr)
  - Reverse M310 no reverse function, M320 3 mph (4.8 km/hr)
- Elevation: M310 0 - 5%, M320 0 - 15%

### DIMENSIONS

- Length: 84 inches (213 cm)
- Width: 38 inches (96.5 cm)
- Height: 74 inches (188 cm)
- Weight: 750 pounds (340 kg), approximately
- Step-up height: 8" (20 cm)

### RECOMMENDED ROOM DIMENSIONS

- Provide a footprint at least 12ft (3.66 meters) long by 8 ft (2.44 meters) wide for adequate spacing around the machine
- A minimum 8 foot (2.44 meters) ceiling height is recommended

### ELECTRICAL

- Power Requirements: 220 VAC 20A, 60 Hertz, NEMA 6-20R receptacle
- Locate the front right corner of the system within 8ft (2.4 meters) of the electrical outlet.

### ENVIRONMENTAL

#### Operating Conditions:

- Ambient Temperature: +50°F to +84°F (+10°C to +29°C)
- Relative Humidity: 20 to 95%

#### Transportation & Storage Conditions:

- Temperature Range: +50°F to +120°F (+10°C to +49°C)
- Relative Humidity: 20 to 95%





## APPENDIX B: OPTIONS AND ACCESSORIES

**AlterG Shorts** Available in the following standard sizes: XS, S, M, L, XL, XXL, XXXL.

**Replacement Safety Magnet** – The AlterG will not operate without the safety magnet

**Zip Care Zipper Lubricant** – Prolong the life of your fabric enclosure and zipper.

**Strataglass Cleaner** – Keep the viewing area clear with this special cleaner.

**SlipCoat** – One ounce packets of lubricant made specifically for the Landice Treadmill. Used as recommended will help prevent premature failure due to friction and excessive wear.

*Contact your AlterG Sales representative for pricing and ordering.*



## APPENDIX C: TROUBLESHOOTING

In most cases any repairs to your AlterG system will need to be completed by a member of the AlterG service team. There are however, many things that you can do to troubleshoot problems before a repair technician will be required.

### REPAIRS

Contact AlterG for any repairs. Before doing so, please investigate the following questions, so that we are able to help you as quickly as possible.

- What is the serial number of the AlterG? This information can be found on the label located on the front of the base frame.
- What happened prior to the problem?
- Did the problem happen unexpectedly or did it get progressively worse over time?
- If it is a noise problem, from where does the noise originate?
- Was someone using the treadmill at the time the problem occurred?
- Explain any other symptoms that you feel are relevant.
- Immediately after the problem, were there any diagnostic codes displayed on the console LED displays?

### DIAGNOSTIC CODES

- The M300 series Anti-Gravity Treadmill performs numerous operational checks to ensure the system is working properly. If the pressure control system or the treadmill is not operating within specification, an error code will be displayed on either the treadmill or %BW display.
- 
- Error Codes displayed on the %BW display:

| Code | Explanation   | Action to be Taken   |
|------|---|--|
| E    | The safety magnet has been displaced.   | Place the safety magnet in proper location and press START.                          |
| L    | The cockpit has not been locked prior to START.   | Ensure the cockpit is fully locked in position and press START.                      |
| OPR  | Over pressure error. The pressure is higher than requested for a particular degree of unweighting. Outflow from the pressure control valve may be blocked or the valve may not be operating correctly.            | Press START. If the error persists call AlterG Customer Support.                     |
| UPR  | Under pressure error. The system is unable to reach the requested pressure for a particular degree of unweighting. There may be a leak, the subject may be too heavy, or the output of the blower may be blocked. | Check system for leaks. Press START. If error persists call AlterG Customer Support. |

- Error Codes displayed on the %BW display (continued):

| Code | Explanation   | Action to be Taken  |
|------|---|---|
| SCO  | The scale offset value is out of range. The weighing scales or electronics may be damaged. The system may have been turned on with someone standing on the treadmill.                         | Remove the subject from the system. Raise the cockpit and cycle the power switch off-on. Wait 30 seconds before attempting to use the system again. If error persists call AlterG Customer Support.   |
| PRS  | The pressure offset value is out of range. The pressure sensor may need replacement.  | Remove the subject from the system. Raise the cockpit and cycle the power switch off-on. Wait 30 seconds before attempting to use the system again. If error persists call AlterG Customer Support.   |
| CE#  | Indicates an error during the calibration process. The subject may be moving too much, there may be an air leak or the system may have been turned on with someone standing on the treadmill. | Check for leaks. Instruct patient to stand still. Press START. If error persists, remove the subject from the system. Raise the cockpit and cycle the power switch off-on. Wait 30 seconds before attempting to use the system again. If error persists call AlterG Customer Support. |

#### Error codes displayed on the Treadmill display:

•

| Code | Explanation  | Action to be taken           |
|------|--|------------------------------|
| L5   | Treadmill motor control board, speed sensor or treadmill motor may be bad.   | Call AlterG Customer Support |
| PO   | The treadmill elevation motor may need replacing, the elevation function may need to be re-calibrated or the elevation potentiometer may be bad. | Call AlterG Customer Support |

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- Write down any observed error codes prior to calling AlterG Customer Support (510-270-5369).

## APPENDIX D: EMC STATEMENT

### Warning:

- MEDICAL ELECTRICAL EQUIPMENT needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in this manual.
- Portable and mobile RF communications equipment can affect MEDICAL ELECTRICAL EQUIPMENT.
- The use of accessories, transducers and cables other than those specified by Alter-G Incorporated, may result in increased EMISSIONS or decreased IMMUNITY of the EQUIPMENT.
- This EQUIPMENT should not be used adjacent to or stacked with other equipment and that if adjacent or stacked use is necessary, the EQUIPMENT should be observed to verify normal operation in the configuration in which it will be used.

Table 201

| Guidance and manufacturer's declaration – electromagnetic emissions   |            |  |
|---|------------|--|
| The EQUIPMENT is intended for use in the electromagnetic environment specified below.   |            |  |
| The customer or the user of the EQUIPMENT should assure that it is used in such an environment.   |            |  |
| Emissions Test  | Compliance |  |
| RF emissions<br>CISPR 11  | Group 1    | The EQUIPMENT uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. |
| RF emissions<br>CISPR 11  | Class A    |  |
| Harmonic emissions<br>IEC 61000-3-2   | Class A    |  |
| Voltage Fluctuations/<br>Flicker emissions  | Complies   |  |
| The EQUIPMENT is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes. |            |  |

Table 202

| Guidance and manufacturer's declaration – electromagnetic immunity  |   |   |  |
|---|---|---|--|
| The EQUIPMENT is intended for use in the electromagnetic environment specified below. The customer or the user of the EQUIPMENT should assure that it is used in such an environment. |   |   |  |
| Immunity test   | IEC 60601 test level  | Compliance level  | Electromagnetic environment – guidance   |
| Electrostatic discharge (ESD)<br>IEC 61000-4-2  | ±6 kV contact<br>±8 kV air  | ±6 kV contact<br>±8 kV air  | Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.   |
| Electrical fast transient/burst<br>IEC 61000-4-4  | ±2 kV for power supply lines<br>±1 kV for input/output lines  | ±2 kV for power supply lines<br>Not Applicable  | Mains power quality should be that of a typical commercial or hospital environment.  |
| Surge<br>IEC 61000-4-5  | ±1 kV differential mode<br>±2 kV common mode  | ±1 kV differential mode<br>±2 kV common mode  | Mains power quality should be that of a typical commercial or hospital environment.  |
| Voltage dips, short interruptions and voltage variations on power supply input lines<br>IEC 61000-4-11  | <5 % <i>UT</i><br>(>95 % dip in <i>UT</i> )<br>for 0,5 cycle<br>40 % <i>UT</i><br>(60 % dip in <i>UT</i> )<br>for 5 cycles<br>70 % <i>UT</i><br>(30 % dip in <i>UT</i> )<br>for 25 cycles<br><5 % <i>UT</i><br>(>95 % dip in <i>UT</i> )<br>for 5 sec | <5 % <i>UT</i><br>(>95 % dip in <i>UT</i> )<br>for 0,5 cycle<br>40 % <i>UT</i><br>(60 % dip in <i>UT</i> )<br>for 5 cycles<br>70 % <i>UT</i><br>(30 % dip in <i>UT</i> )<br>for 25 cycles<br><5 % <i>UT</i><br>(>95 % dip in <i>UT</i> )<br>for 5 sec | Mains power quality should be that of a typical commercial or hospital environment. If the user of the EQUIPMENT requires continued operation during power mains interruptions, it is recommended that the EQUIPMENT be powered from an uninterruptible power supply or a battery. |
| (50/60 Hz) magnetic field<br>IEC 61000-4-8  | 3 A/m   | 3 A/m   | Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.  |
| NOTE <i>UT</i> is the a.c. mains voltage prior to application of the test level.  |   |   |  |

Table 204


| Guidance and manufacturer's declaration – electromagnetic immunity  |  |                            |   |
|---|--|----------------------------|---|
| The EQUIPMENT is intended for use in the electromagnetic environment specified below. The customer or the user of the EQUIPMENT should assure that it is used in such an environment.   |  |                            |   |
| Immunity test   | IEC 60601 test level   | Compliance level           | Electromagnetic environment – guidance  |
| <p>Conducted RF<br/>IEC 61000-4-6</p> <p>Radiated RF<br/>IEC 61000-4-3</p>  | <p>3 Vrms<br/>150 kHz to 80 MHz</p> <p>3 V/m<br/>80 MHz to 2,5 GHz</p> | <p>3 Vrms</p> <p>3 V/m</p> | <p>Portable and mobile RF communications equipment should be used no closer to any part of the EQUIPMENT, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p><b>Recommended separation distance</b></p> <p><math>d = [3.5/V1]\sqrt{P}</math></p> <p><math>d = [3.5/E1]\sqrt{P}</math> 80 MHz to 800 MHz</p> <p><math>d = [7/E1]\sqrt{P}</math> 800 MHz to 2.5 GHz</p> <p>where <math>P</math> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and <math>d</math> is the recommended separation distance in metres (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey<sup>a</sup>, should be less than the compliance level in each frequency range.<sup>b</sup></p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p>  |
| <p>NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.</p> <p>NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p>  |  |                            |   |
| <p><sup>a</sup> Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the EQUIPMENT is used exceeds the applicable RF compliance level above, the EQUIPMENT should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the EQUIPMENT.</p> <p><sup>b</sup> Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p> |  |                            |   |



Table 206

| Recommended separation distances between portable and mobile RF communications equipment and the EQUIPMENT   |  |   |  |
|--|--|---|--|
| The EQUIPMENT is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the EQUIPMENT can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the EQUIPMENT as recommended below, according to the maximum output power of the communications equipment.  |  |   |  |
| Rated maximum output power of transmitter<br>W   | Separation distance according to frequency of transmitter<br>m |   |  |
|  | 150 kHz to 80 MHz<br>$d = [3.5/V1]\sqrt{P}$                    | 80 MHz to 800 MHz<br>$d = [3.5/E1]\sqrt{P}$ | 800 MHz to 2.5 GHz<br>$d = [7/E1]\sqrt{P}$ |
| 0.01   | 0.12   | 0.12  | 0.23                                       |
| 0.1  | 0.37   | 0.37  | 0.74                                       |
| 1  | 1.17   | 1.17  | 2.33                                       |
| 10   | 3.69   | 3.69  | 7.39                                       |
| 100  | 11.67  | 11.67                                       | 23.33                                      |
| <p>For transmitters rated at a maximum output power not listed above, the recommended separation distance <math>d</math> in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where <math>P</math> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.</p> <p>NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.</p> <p>NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p> |  |   |  |



## APPENDIX E: USER/READER COMMENT FORM

In order to improve the quality and utility of our manuals, AlterG needs the active cooperation and participation of its user readership. Your comments as a user will be greatly appreciated and reviewed for information to improve the next revision of this document.

Did you find this manual to be complete in its information?

YES ☐

NO ☐

If no, what information would you like to see included?

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Are the instructions in this manual clearly expressed and easy to understand? (circle one)

Difficult to understand

Adequate

Very understandable

Did you find any errors or inaccuracies in this document? If so, please write down the page number(s) below.

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How would you rate the usefulness of this document? (circle one)

Not useful

Adequate

Very useful

How can this manual be improved to better meet your needs?

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Do you have any other comments to add?

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Please fill in the contact information below:

|              |        |
|--------------|--------|
| Name:        | Title: |
| Facility:    | Phone: |
| Address 1:   | Email: |
| Address 2:   | Date:  |
| City:        |        |
| State:       |        |
| Postal Code: |        |
| Country:     |        |

Thank you for taking the time to fill out this survey. Please mail to:

AlterG Incorporated  
 Attention: Customer Support  
 48438 Milmont Drive  
 Fremont, CA. 94538

Should you have any questions please feel free to call Customer Support at 510-270-5369 or email us at [support@alter-g.com](mailto:support@alter-g.com)

## **APPENDIX F: WARRANTY INFORMATION**

Your AlterG is covered by the following warranty:

- One year parts and labor for the entire machine.

AlterG warrants that all products and accessories will be free from manufacturing defects according to the applications listed in this manual. The warranty period commences on the original date of purchase. This warranty is given only to the original purchaser. This warranty does not cover damage or equipment failure resulting from misuse, abuse, or failure to comply with electrical codes. Further, this warranty shall not apply if there is any modification to the product or accessories or if there is a failure to provide maintenance as outlined in this Operation Manual.

**ALTERG GIVES NO OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED. THE WARRANTY OF FITNESS FOR A PARTICULAR USE IS HEREBY DISCLAIMED.**

The buyer's remedy for breach of the expressed warranties contained herein shall be limited to the return of the product and accessories and repayment of the original purchase price. Provided, however, at AlterG's discretion, it may repair and replace the non-conforming goods or parts. AlterG shall not be liable for any incidental or consequential damages. This Warranty is voided if non-AlterG parts or service are used in repairs and maintenance.